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NR. 137-59

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COMPRESSED DEHYDRATED SUBSISTENCE
GREAT BRITAIN (U)

27 July 1959

Best Available Copy

QUARTERMASTER FOOD AND CONTAINER INSTITUTE FOR THE ARMY
Quartermaster Research and Engineering Command
U. S. Army
Chicago 9, Illinois

U. S. ARMY NATICK LABORATORIES

NATICK, MASSACHUSETTS

IN REPLY REFER TO

AMXRE-F

23 June 1964

Mr. George K. Taylor, Chief
Acquisitions and Control Branch
Technical Information Division
U. S. Department of Commerce
Office of Technical Services
Washington 25, D. C.

C.F.S.T.I. INPUT SECTION

NOTIFICATION LETTER

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Dear Mr. Taylor:

In response to your letter dated 7 January 1964, we are pleased to forward for your retention the inclosed QFCIAF Foreign Material Report 137-59, "Compressed Dehydrated Subsistence." D 550

The report is not scheduled for publication in the open literature but we have no objection to its public release.

We regret the long delay in answering your request.

Sincerely,

1 Incl
Compressed Dehyd Sub
Great Britain (U)

George K. Taylor, Jr.
for FERDINAND P. MEHLICH
Director
Food Division

FOREIGN MATERIEL SUBSISTENCE TEST REPORT - TYPE B

REPORT NR. 137-59 (G. BRIT)

27 July 1959

SUBJECT: Compressed Dehydrated Subsistence, Great Britain (U)

REFERENCE: Letter, QMCAL-MAG to TQMG, 19 June 1959, subject: Acquisition of Compressed Dehydrated Subsistence - Great Britain

I. INTRODUCTION:

Six (6) compressed dehydrated subsistence items in triplicate were provided the Quartermaster Food and Container Institute for the Armed Forces by the Ministry of Agriculture, Fisheries and Food of Great Britain. The items had been prepared and packaged at the Experimental Factory (MAFF), Greyhope Road, Aberdeen, Scotland.

Similar products have been reported in QMF&CI Foreign Materiel Reports: 129-59 (AUSTRALIA), 30 January 1959, "Compressed Dehydrated Vegetables, Australia (U)" and 135-59 (G. BRIT), 28 May 1959, "Composite Ration, Lightweight, 5 Man-Day Units, G. Britain (U)."

The Simplified Food Logistics Program of the QMF&CI has been directing its efforts toward military subsistence items which are varied, palatable, nutritious, high in caloric density, economical in cube, light in weight, easily and quickly prepared, stable in storage under varying conditions of time, temperature and humidity, and packaged in flexible packaging material. QMF&CI efforts have been directed toward air and freeze-dried products. Although many foods lose much of their bulk on dehydration, many of them have the same or nearly the same cube after drying. British research and development has paralleled that of the QMF&CI but has gone a step further to compress their dried foods. MAFF has provided these samples in response to QMF&CI inquiries about compressed subsistence.

The cube-weight saving in compressed dehydrated subsistence can be spectacular. Of the six (6) items examined, the cabbage, carrots and rutabagas have been reduced almost to their minimum possible cube, while the broad beans, green beans and peas show a significant saving.

With the exception of the broad beans, unfamiliar to the U. S. diet, and the rutabagas, not common in the general U. S. diet, the items could be incorporated into U. S. rations with fair to good acceptability.

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II. ITEMS:

<u>ITEM</u>	<u>WGT/PKG</u> <u>(oz)</u>	<u>CUBE</u> <u>(in³)</u>	<u>COOKED</u> <u>WGT (oz)</u>	<u>COOKED</u> <u>CUBE (in³)</u>	<u>WGT</u> <u>SAVING %</u>	<u>WGT</u> <u>SAVING %</u>
Cabbage	3/4	2.0(2.6)	6.(8)	21.6(28.8)	87.5	80.9
Carrots	1	1.9	5	12.6	80.0	78.8
Swedes	1	1.85	6	18.1	83.3	80.5
Broad Beans	1	8.9	5.5	12.6	81.8	79.2
Green Beans	1	12.6	8.5	25.4	88.2	80.5
Peas	1	7.6	4.5	10.8	77.8	79.7

(Bracketed figures are calculated to 1 oz basis).

III. ITEM EVALUATIONS:

The items were prepared and served by the Experimental Kitchens Branch of the Food Division, QMF&CI on 29 June 1959 in the presence of packaging and food technologists. The technological ratings are summarized in Section IV of this report. In general, the comments about each item represent those features of the item which were undesirable in the opinion of the testers.

British pints are quoted in the instructions. These were converted to U. S. equivalents (1 British gallon = 1.2 U. S. gallon).

The package dimensions are the conforming measurements rather than the flat dimensions. The flat figures will be about one (1) inch longer and one (1) inch wider.

1. Cabbage (air dried):

One (1) compressed block is wrapped in parchment, conform wrapped with melinex-foil-extruded polyethylene, vacuum packed and heat sealed to form a unit, 2-1/4L x 2W x 7/16"D. The label is of wraparound sulfite paper, mimeographed in black ink, cut to fit the package and affixed with transparent pressure sensitive cellulose tape. The legend is: on one (1) side, CABBAGE, 3/4 oz, PREPARED AND PACKED BY THE MINISTRY OF AGRICULTURE, FISHERIES AND FOOD, AT THE EXPERIMENTAL FACTORY, GREYHOPE ROAD, ABERDEEN, SCOTLAND, DATE: 28 May 1959 (stamped in red); on the other side, INSTRUCTIONS: PUT INTO 3/4 PINT OF BOILING WATER, ADD SALT, BOIL GENTLY 10-15 MINUTES (UNTIL TENDER), DRAIN THOROUGHLY.

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The block breaks apart readily. The product is in the form of large flakes. The reconstituted product is lacking in green, but the appearance approaches that of the fresh item. The odor is faint but characteristic. The texture is comparable to that of cole slaw, tough and crisp. The overall rating is 6.9, below good - above fair.

The estimated caloric density is 3.0 cal/gm, 64 calories/oz.

2. Carrots (air dried, precooked):

One (1) compressed block is packed and labelled in the same manner as the cabbage above. The wrapped dimensions are: 2-1/4" L x 1 x 7/16" D. The legend on the label is: CARROTS, 1 oz, PREPARED..... DATE: 28 May 1959, INSTRUCTIONS: PUT INTO 1/2 PINT OF BOILING WATER. ADD SALT. BOIL GENTLY FOR 7-8 MINUTES. DRAIN AS THOROUGHLY AS POSSIBLE.

The block breaks apart readily. The carrots are in the form of small chips. The reconstituted product is darker than freshly prepared carrots. The odor and flavor are similar to that of pressure carrots. The overall rating is 6.5, below good - above fair.

The estimated caloric density is 3.4 cal/gm, 96 cal/oz.

3. Swedes (Rutabagas, air dried, precooked):

One (1) compressed block is packed and labelled in the same manner as the cabbage and carrots. The wrapped dimensions are: 2-1/4" L x 1 x 7/16" D. The legend on the label is: SWEDE, 1 oz, PREPARED..... DATE: 28 May 1959, INSTRUCTIONS: PUT INTO 1/2 PINT OF BOILING WATER. ADD SALT. BOIL GENTLY FOR 7-8 MINUTES. DRAIN AS THOROUGHLY AS POSSIBLE.

The block breaks apart readily into small chips. The color is pale, lacking in orange overtones. The odor is faint but characteristic. The texture is slightly tough, firm. The flavor is mild. The overall rating is 6.9, below good - above fair.

The product is good technologically but would not be applicable for U. S. use since it is not a common food in the general U. S. diet.

The estimated caloric density is 3.3 cal/gm, 94 cal/oz.

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4. Broad Beans (freeze dried):

The lightly compressed beans are protected by a folded bleached kraft liner, conform wrapped in melinex-foil-extruded polyethylene, vacuum packed and heat sealed to form a package, 3-5/8L x 2-3/16W x 1-1/8"D. The label, similar to the foregoing items, has the legend: BROAD BEANS, 1 oz, PREPARED.....DATE: 28 May 1959, INSTRUCTIONS: REMOVE LINER. PUT CONTENTS INTO 3/4 PINT OF BOILING WATER, ADD SALT, SOAK FOR 5 MINUTES. BRING BACK TO BOIL AND BOIL UNTIL TENDER (2-5 MINUTES). DRAIN THOROUGHLY.

None of the testers had experienced this particular item previously. The block broke apart readily. The beans are somewhat like Lima Beans in appearance but are much larger and are covered with a skinlike hull, which is off-white in color with purple marbling. The hull was so tough and fibrous that one (1) tester rated the hulls and beans separately, viz. overall ratings of 4.0 for the hulls (below fair - above poor) and 7.0 for the beans (good). The beans are kidney-shaped, light green of skin and darker green of interior. The initial odor during cooking is extremely unappetizing, unclean. This odor diminishes with cooking and standing. The flavor is very bitter and rancid. The texture is mushy. The overall rating is 4.4, below fair - above poor.

This item would not be applicable to U. S. feeding unless it could be modified in flavor with spices or other ingredients, since it is not familiar to the U. S. diet.

The estimated caloric density is 3.6 cal/gm, 102 cal/oz.

5. Green Beans (freeze dried):

The lightly compressed block is packaged similarly to the Broad Beans. The wrapped dimensions are: 3-1/4L x 2-1/16W x 1-7/8"D. The legend on the label is: GREEN BEANS, 1 oz, PREPARED.....DATE: 28 May 1959, INSTRUCTIONS: REMOVE LINER, PUT CONTENTS INTO 3/4 PINT OF BOILING WATER, ADD SALT AND SOAK FOR 5 MINUTES. BRING BACK TO BOIL AND BOIL FOR 2-3 MINUTES UNTIL TENDER. DRAIN THOROUGHLY.

The block breaks apart readily. The aroma is that of the fresh item but faint. The product consists of short cut mature beans with thick seed walls. All of the strings have not been removed. The skins are spotted and sloughed. The color is pale, lacking in green. The texture is mushy. The overall rating is 7.0, good.

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The estimated caloric density is 2.8 cal/gm, 79 cal/oz.

6. Peas (freeze dried):

The lightly compressed block is packaged similarly to that of the broad beans and green beans. The wrapped dimensions are: 3L x 2-1/4W x 1-1/8"D. The legend on the label is: PEAS, 1 oz, PREPARED.....DATE: 28 Apr 1959, INSTRUCTIONS: REMOVE LINER, PUT CONTENTS INTO 1/2 PINT OF BOILING WATER, ADD SALT, SOAK FOR 5 MINUTES. BRING BACK TO BOIL AND BOIL UNTIL TENDER (2-5 MINUTES). DRAIN THOROUGHLY.

The block breaks apart easily. The product consists of small garden variety very mature slit green peas. The color is pale, lacking the bright green of the fresh item. The texture is variable, mealy or starchy. The skins are tough. The odor is faint but "fresh." The overall rating is 6.8, below good - above fair.

The estimated caloric density is 3.7 cal/gm, 105 cal/oz.

IV. TECHNOLOGICAL RATINGS:

<u>ITEM</u>	<u>COLOR</u>	<u>ODOR</u>	<u>FLAVOR</u>	<u>TEXTURE</u>	<u>APPEARANCE</u>	<u>OVERALL</u>
Cabbage	7.5	6.8	7.1-	6.3	7.3	6.9
Carrots	6.6	6.3	6.7	6.7	6.5	6.5
Swedes	7.3	6.9	6.8	6.7	7.0	6.9
Broad Beans	4.9	4.8	4.3	4.9	4.6	4.4
Green Beans	7.5	6.9	7.4	6.8	6.9	7.0
Peas	8.1	6.8	6.5	6.2	7.8	6.8

9 - Excellent
8 - Very Good
7 - Good

6 - Below Good, Above Fair
5 - Fair
4 - Below Fair, Above Poor

3 - Poor
2 - Very Poor
1 - Extremely Poor

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V. ACKNOWLEDGMENT:

This report, coordinated by the Military Advisory Group, has been prepared with the technical assistance of the Food Division and Container Division of the Quartermaster Food and Container Institute for the Armed Forces.

FOR THE COMMANDANT:



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